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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/967,062	09/28/2001	Rustin W. Allred	TI-29986	4933

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EXAMINER
LAO, LUN S

ART UNIT	PAPER NUMBER
2643	4

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/967,062	ALLRED ET AL.	
	Examiner	Art Unit	
	Lun-See Lao	2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20* is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. Claim 1-20 of U.S. application 09/967,062 filed on 09-28/2001 are presented for examination.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 16-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The driven " applying said digital audio filters to digital signals representative of received sound to generate third digital data, converting said third digital data to an analog signal and providing said analog signal to a speaker in said hearing aid, generating fourth digital data representative of an enhanced response curve of hearing ability of sound level versus frequency; comparing said first digital data to said fourth digital data and determining whether said enhanced response curve is within said tolerance range; and automatically optimizing the frequency, amplitude and bandwidth of 24 said digital audio filters until said enhanced response curve is within said tolerance range or a predetermined limit on the number of digital audio filters has been reached,

whichever occurs first" (see page 5 line 15-page 6 line11) was not described in the further detail in the specification nor in any of the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims1-19 are rejected under 35 U.S.C. 102(a) as being anticipated by Gauthier (PCT WO 90/09760).

Consider claim 1 Gauthier teaches a method for generating digital filters for tuning a hearing aid to enhance hearing ability comprising:

providing first digital data (see fig.11 (target curve 118)) for a tolerance range for a target response curve representative of said enhanced hearing ability of sound level versus frequency;

providing second digital data (see fig.11 (loss curve 114)) representing an initial response curve of an initial hearing ability to be enhanced of sound level versus frequency;

comparing (see fig.10, (108)) said first digital data to said second digital data and determining whether said initial response curve is within said tolerance range; and

if said initial response curve is not within said tolerance range,

iteratively generating digital audio filters, applying said digital audio filters to said second digital data to generate third digital data for a compensated response curve, and automatically optimizing the frequency, amplitude and bandwidth of said digital audio filters until said compensated response curve is within said tolerance range or a predetermined limit on the number of digital audio filters has been reached, whichever occurs first inherently (see page 34 line 15-page 35 line 5).

Consider claims 2-3, 5-6 Gauthier teaches a method of the step of iteratively generating digital audio filters is performed by iteratively generating second order filters (see fig.5 and page 15 line 10-15) and the initial response curve is an audiogram (see fig.11).

Consider claim 4 Gauthier teaches a method for generating a set of second order filters to tune a hearing aid to enhance hearing ability comprising:

providing first digital data (see fig.11(118 target curve)) for a tolerance range for a target response curve representative of said enhanced hearing ability of sound level versus frequency;

providing second digital data (see fig.11(114 loss curve)) representative of an initial response curve of an initial hearing ability to be enhanced of sound level versus frequency;

comparing (see fig.10 (108)) said first digital data to said second digital data and determining whether said initial response curve is within said tolerance range;

and

if said initial response curve is not within said tolerance range, generating a set of filters to tune said hearing aid by performing the following optimizing steps iteratively (see page 34 line 15-page 35 line 5),

digitally processing said second digital data to determine an n^{th} (see fig.5 (516-528)) set of initial parameters (column of table) for an n^{th} peak in said actual initial curve where said initial response curve is not within said tolerance range, including a frequency, and amplitude and a bandwidth for said peak, where n^{th} is the number of an iteration of said optimizing steps, digitally generating a compensating n^{th} filter from said n^{th} set of initial parameters (column of table), applying said n^{th} filter to said second digital data and modifying said n^{th} set of initial parameters to determine an n^{th} set of optimum parameters (column of table) for said compensating n^{th} filter, to generate third digital data for an n^{th} interim compensated response curve of sound level versus frequency, processing said third digital data to determine whether said n^{th} interim compensated response curve is within said tolerance range, if said n^{th} interim compensated response curve is not within said tolerance range, performing another iteration of said optimizing steps until said interim compensated response curve is within said tolerance range or a predetermined limit on the number of filters has been reached, whichever occurs first inherently (see 34 line 15-col.5 line 5).

Consider claim 7 Gauthier teaches a method for generating filters for tuning a hearing aid to enhance hearing ability comprising:

providing first digital data (see fig.11 (118 target curve)) for a tolerance range for a target response curve representative of said enhanced hearing ability of sound level versus frequency;

providing second digital data (see fig.11 (114 loss curve)) for an initial response curve of said hearing ability to be enhanced of sound level versus frequency;

comparing (see fig.10 (108)) said first digital data to said second digital data and determining whether said initial response curve is within said tolerance range; and

if said initial response curve is not within said tolerance range, generating a set of compensating filters by performing the following single filter optimizing steps iteratively (see page 34 line 15-page 35 line 5),

digitally processing said second digital data to determine an n^{th} set of initial parameters (see fig.5 (516-528)) for an n^{th} peak in said initial response curve where said initial response curve is not within said tolerance range, including a frequency, an amplitude and a bandwidth for said peak, where n is the number of an iteration of said optimizing steps, digitally generating a compensating n^{th} filter from said n^{th} set of initial parameters, applying said nth filter to said second digital data and modifying said n^{th} set of initial parameters to determine an n^{th} set of optimum parameters for said n t" filter, to generate third digital data for an n^{th} interim compensated response curve of sound level versus frequency (see page 16 line 11-page 17 line 18);

if n > 1, performing the following joint filter optimizing steps iteratively and cyclically, generating fourth digital data for interim computed response curves in which for each joint filter optimizing iteration one of said n filters is absent, and then performing said

single filter optimization steps utilizing said fourth digital data to generate fifth digital data for an updated interim response curve, digitally processing said fifth digital data to determine whether the most recent of said joint filter optimizing iterations has resulted in a change in said updated interim response curve greater than a predetermined amount of change, and if so continuing to perform said joint filter optimizing steps; processing said fifth digital data to determine whether said n^{th} interim compensated response curve is within said tolerance range, and if not (see page 35 line 20-page 36 line 24),

performing another iteration of the foregoing steps until said interim compensated response curve is within said tolerance range or a predetermined limit on the number of filters has been reached, whichever occurs first, but if so, ceasing performance of further iterations(see page 36 line 25-page 37 line 6).

Consider claims 8-9 Gauthier teaches a method of the step of digitally generating a compensating n^{th} filter is performed by digitally generating a second-order filter (see fig.5 (516-528)); and the initial response curve is an audiogram (see fig.11).

Consider claim 10, Gauthier teaches a method for generating filters for tuning a hearing aid to enhance hearing ability of an individual comprising:

fitting said hearing aid to said individual (see abstract);

connecting (see fig.1) said hearing aid (26r,l) to a source of audio digital signals;

providing said individual with a device (16,20) to generate indication signals at will;

generating and providing (10) a first series of audio digital signals to said hearing aid (26R,L), each signal in said first series of signals having a selected

frequency and multiple power levels (see pag 38 line 5-16);

receiving said indication (16,20) signal during said generation of a signal of a selected frequency indicative of said individual hearing said selected frequency (see page 38 line 18-26);

providing a digital audio processing unit (10,20) in said hearing aid (26RL) for processing received audio digital signals and providing processed audio digital data, including applying digital audio filters (see fig.5 (516-528))for tuning said hearing aid characterized by coefficients in algorithms applied to said received audio digital signals to effect said digital audio filters (see page 38 line 27-page 39 line 10);

providing a digital computer (10) connected to receive said first series of audio digital signals (see fig.5 (510)) and said indication (16,20) signals to generate digital data representative of said individual's hearing ability using said hearing aid without filters determined from said first series of signals (see fig.5 (510) and see page 20 line 19-30)), said computer programmed to determine said coefficients for digital filters for tuning said hearing aid and providing said coefficients to said digital audio processing unit in said hearing aid (see page 37 line 7-23).

Consider claim 11 Gauthier teaches that a method of the digital computer is programmed to determine said coefficients by

providing second digital data (see fig.11 (118 target curve)) for a tolerance range for a target response curve ability of representative of said individual's enhanced hearing ability of sound level versus frequency;

providing first digital data (see fig.11 (114 loss curve)) representative of an initial response curve of said individual's hearing ability of sound level versus frequency;

comparing (see fig.10 (108)) said second digital data to said first digital data and determining whether said response curve is within said tolerance range; and

if said response curve is not within said tolerance range, iteratively generating coefficients for digital audio filters, applying digital audio filters determined by said coefficients to said first digital data to generate third digital data for a compensated response curve, and automatically optimizing said coefficients by optimizing the frequency, amplitude and bandwidth of said digital audio filters until said compensated response curve is within said tolerance range or a predetermined limit on the number of digital audio filters has been reached, whichever occurs first inherently (see page 34 line 15-page 35 line 5).

Consider claims 12-13, Gauthier teaches the method of computer receives said first series of signals and indication signals generated by said device to generate said first digital date (see page 37 line 25-page 38 line 16); and first digital data is an audiogram (see fig.11 (118)).

Consider claim 14 Gauthier teaches an apparatus for generating filters for tuning a hearing aid for use by an individual, comprising:

a source of first audio digital data (see fig.1 (10));

a digital audio processing unit (10,20) in said hearing aid for processing said first audio digital data and providing processed audio digital data to said individual, including applying digital audio filters for tuning said hearing aid characterized by

coefficients in algorithms applied to said first audio digital data to effect said digital audio filters (see page 38 line 5-16);

a device for generating indication (16,20) signals indicative of said individual receiving said first audio digital data; and a digital computer connected to receive said first audio digital data and said indication signals, said digital computer programmed to determine said coefficients for digital filters for tuning said hearing aid and provide said coefficients to said digital audio processing unit (see page 37 line 9-23).

Consider claim 15, Gauthier teaches that an apparatus of the digital computer is programmed to generate second digital data representative of said individual hearing ability when using said hearing aid without filters determined from said first audio digital data (see fig.5 (510) and page 16 line 11-page 17 line25) and said indication signals and to determine said coefficients by

providing third digital data (see fig.11, (118 target curve)) for a tolerance range for a target response curve of enhanced hearing of sound level versus frequency;

providing said second digital data (see fig.11 (114 loss curve)), wherein said second digital data represents an initial response curve of hearing ability of sound level versus frequency;

comparing (see fig.10 (108)) said third digital data to said second digital data and determining whether said initial response curve is within said tolerance range; and

if said initial response curve is not within said tolerance range, iteratively generating coefficients for digital audio filters, applying digital audio filters determined by said coefficients to said second digital data to generate fourth digital data for a compensated

response curve, and automatically optimizing said coefficients by optimizing the frequency, amplitude and bandwidth of said digital audio filters until said compensated response curve is within said tolerance range or a predetermined limit on the number of digital audio filters has been reached, whichever occurs first inherently (see page 36 line 9-page 37 line6).

Consider claim 16 Gauthier teaches a method for generating digital filters for tuning a hearing aid to enhance hearing ability, comprising:

providing first digital data (see fig.11 (118 target curve)) for a tolerance range for a target response curve representative of said enhanced hearing ability of sound level versus frequency;

providing second digital data (see fig.11 (114 loss curve)) representing an initial response curve of an initial hearing ability to be enhanced of sound level versus frequency;

comparing (see fig.10 (108)) said first digital data to said second digital data and determining whether said initial response curve is within said tolerance range; and

if said initial response curve is not within said tolerance range, iteratively generating digital audio filters to compensate said initial response curve (see page 34 line 15-page 35 line 5),

applying said digital audio filters to digital signals representative of received sound to generate third digital data, converting said third digital data to an analog signal and providing said analog signal to a speaker in said hearing aid,

generating fourth digital data representative of an enhanced response curve of hearing ability of sound level versus frequency;

comparing said first digital data to said fourth digital data and determining whether said enhanced response curve is within said tolerance range; and

automatically optimizing the frequency, amplitude and bandwidth of said digital audio filters until said enhanced response curve is within said tolerance range or a predetermined limit on the number of digital audio filters has been reached, whichever occurs first inherently (see page 34 line 15-page 35 line 5).

Consider claims 17-19 Gauthier teaches a method of the step of iteratively generating digital audio filters is performed by iteratively generating second order filters (see page 35 line 20-page 36 line 24 (13 values is 13 digital filters); and the initial response curve is an audiogram (see fig.11 (loss curve)) and the enhanced response curve is an audiogram (see fig.11 (target curve)).

Allowable Subject Matter

5. Claim 20 is allowed.

Conclusion

6. The prior art made of record and not relied upon is considered to applicant's disclosure. Sjursen (US PAT.6,292,571); Hochmair (US PAT. 4,577,641) and King (US PAT. 4,615,007) are recited to show other related to method and apparatus for tuning digital hearing aids.

7. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:(703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (703) 305-2259 The examiner can normally be reached on Monday-Friday from 8:00 to 6:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

DUC NGUYEN
PRIMARY EXAMINER

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